

CLAIMS

1. A collector (1) designed to be connected to a heat pump, comprising a number of tubes (2), which are mainly parallel to each other and which in a meander-like way are connected to each other in pairs by means of 180° bends (3), alternately mounted at the one or the other collector end, means (6) also being provided in order to connect the tubes to each other, **c h a r a c t e r i z e d i n t h a t** said connection means (6) connect adjacent bends (3) to each other, and in that these connection means at the top of a collector include aeration channels (13) , which connect the interior (12) of the bends to each other.

2. A collector according to claim 1, **c h a r a c t e r i z e d i n t h a t** the bends (3), when they are applied to the tubes, are designed as 90° bend pairs with one 90° bend forming a 180° bend half to a 180° bend and with the other 90° bend forming a 180° bend half to an adjacent 180° bend, and in that said connection means (6) connect said 90° bends (3) to each other,

3. A collector according to claim 1 or 2, **c h a r a c t e r i z e d i n t h a t** said 180° and 90° bends (3) respectively are manufactured in one piece jointly with the matching connection means (6).

4. A collector according to any of claims 1-3, **c h a r a c t e r i z e d i n t h a t** the collector (1) is made of a plastic material and includes a large number of tubes (2) in parallel to each other and preferably having a relatively large outer diameter, i.e. about 40 mm, in that the length of the tubes preferably is 1-3 m, preferably about 2 m, in that the distance between the central axes of adjacent tubes is 5-20 cm, preferably about 10 cm, and in that an arbitrary number of tubes, e.g. 10-25 , form the collector, preferably in a common plane.

5. A collector according to any of claims 1-4, **characterized in that** adjacent tube ends generally are connected to each other by means of two 90° bends (3), which abut, e.g. with contact, each other and said tube ends respectively, in that such a connection between tubes and 90° bends preferably is fixed through welding, in that on the inlet and the outlet side there are connection tubes (4 and 5 respectively), which suitably are arranged in the same bend line, a 90° bend (3) connecting the outer collector tube with said connection, in that the connection tubes suitably have such a length, that two collectors, connected in series and abutting each other with their respective connection tubes, can be connected through conventional tube couplings and in that, when a connection in parallel is done, the used connection tubes are connected to a manifold coupling, which leads to a heat pump, respectively.

6. A collector according to any of claims 1-5, **characterized in that**, when 90° bends are used, they are arranged/manufactured as a mirror-inverted pair in one piece together with a connection element (6), which connects the two bends, preferably at the same level as the outer area of the bend legs (7), which are to be connected to the corresponding adjacent bend legs (7).

7. A collector according to any of claims 1-6, **characterized in that** the connection means (6) for the bends, which are to be arranged at the bottom of a collector, are rod-like, possibly with a tube profile, in which however at least one section (8), preferably a central section, is provided with a bending notch, e.g. in the form of a compression or another thickness reduction (9), which suitably is mirror-symmetrical jointly with the bend pair for the rest in order to allow/promote a folding around the section (8), tube connection legs (10) of the bends (8) approaching each other along circular movement paths with the symmetry axis (11) running through the section (8) as an oscillating axis, and in that, when the connection means (6) is designed as a tube, the section (8) suitably is designed as a compression, which

eliminates or at least reduces the inner tube cross section, particularly if the tube communicates with the interior (12) of the bends.

8. A collector according to any of claims 1-7, **characterized in that** the collector is designed to be mass produced in a plant, preferably in a flat shape, the connection elements being designed to guarantee the principal shape of the connector, shape adjustments, e.g. when the collector is positioned in the ground, being possible, e.g. bendings around obstacles in the ground, in that the positioning of the collector in the ground is designed to be done by means of a digging machine having a minimal bucket width, in that a large number of, e.g. 6-10 collectors are designed to be connected preferably in series after each other having upper connection elements designed to allow a satisfactory accessibility during a mounting and possibly a later control.

9. A collector according to any of claims 1-8, **characterized in that** the connection elements with aeration channels have a certain limited bendability, whereas the connection elements without aeration channels suitably have an increased bendability.

10. A collector according to any of claims 1-9, **characterized in that** 180° bends are the starting components, when the collector is manufactured, each one of which is provided with a connection element, the one and the other extending in each direction, the length of which is e.g. half the length of the finished connection element, in that two connection element halves, which abut against each other, can be connected to each other, e.g. through welding or by giving the collection element halves a somewhat larger length and different diameters, the ends, which meet each other, being able to be introduced into each other and possibly be glued together, and/or in that, when 90° bends are used as starting components, they also are connected to each other by means of a wall, a film the like, the upper end of which is

formed by the connection element and/or in that there are bending notches, designed in various ways, in the connection elements, which allow sections to be turned e.g. up to 90° , of e.g. 2-4 tubes at a time in relation to each other, i.e. with 2-4 tubes forming a flat portion at a time, which is designed to be swung up to 90° in relation to the adjacent parts and/or in that particularly the lower bends are provided with connection elements in the form of hinges, joints or the like, particularly in the form of ear-like male parts with pins and female parts with holes, projecting from the tube connection legs (10), which are designed to be snapped together to obtain a durable, longitudinal bendable bond, the symmetry axis (11) of which running through said holes and pins.